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A River Parkway.

TWO years ago we discussed in these columns (see vol. vii., pp. 191 and 231) certain projected improvements in the lower reaches of the Charles River, lying within the limits of Greater Boston, and recommended by a joint committee consisting of the Metropolitan Park Commission and the State Board of Health. This work has been already begun, although an insufficient appropriation has prevented the complete realization of the admirable plan, and the beauty of the banks, not to speak of the comfort of the people who live near them, in one conspicuous instance at least, has been marred by the erection of a manufacturing establishment on ground which the city ought to have possessed. This first report related to that portion of the river which is mainly a tidal estuary, while a second and most interesting one, just issued, covers the course of the stream from the head of tide-water for sixteen miles through the metropolitan district between Dedham and Watertown.

In their review of the situation the landscape-architects of the Commission, Messrs. Olmsted, Olmsted & Eliot, describe this as a typical example of the small rivers which have been forced out of their channel by the stony rubbish of the ice age and have found their way through its billowy surface as best they might, filling up one hollow and overflowing into the next. The scenery, which is pleasant without being very striking, consists of gravel bluffs and ridges, originally forested and many still clothed with wood, with gentler slopes which have long been cleared and cultivated, and occasional swamps between the stream and the higher lands, still filled with rushes and sedges. In the early years of the country the river was a commercial highway, and Watertown, at the head of the tide, was an important point; but under the act for encouraging manufactures the commonwealth gave as much of the common property in rivers and lakes of the state as was needed for water-power, so that there are eight dams now along the main stream about which villages cluster, and one of them has become a city. But the time has come when the growth of Boston and its suburbs demands a reconstruction of the condition of the river and a regulation of it to meet the needs of this new population, and as a matter of fact it is stated that in spite of the defacement of the banks and the inconvenience occasioned by the dams, the river has once more come to be used as a highway, but a highway of pleasure instead of traffic. Now the inhabitants of this region stand more and more in need of means of recreation. Boating is one of the most agreeable of pastimes, and this river furnishes the most pleasant boating-course near Boston, and, therefore, the landscape-architects recommend that it shall be preserved as a parkway—that is, that the river and its scenery for these sixteen miles be made the central feature of a park, with its banks and waters available for public recreation.

If any such plan is adopted the first duty of its administration would be to keep the current clean from sewage and objectionable waste from factories which offends the eye and exhales noisome odors. The second duty would be to restrain dam owners from raising or lowering water-levels. This is not only because the lowering of the water leaves an exposure of muddy banks which displeases the eye, but the hot sun soon helps to decompose the rank vegetable matter, not to speak of animal matter which is sure to collect along the margins of this open sewer, so that the exhalations from these become a source of discomfort, and, what is still worse, deleterious to the public health. The third duty of the authorities in charge should be to provide public passageways over and around the dams for men and boats, and among many other recommendations it is incidentally suggested that electric launches might be rented to run as omnibus-boats or as cabs.

But simply to secure the navigation of a river is not to make it a water-parkway, unless the charm of the scenery is to be preserved and enhanced. Of course, it is impossible to banish manufacturing from streams in thickly settled communities, but, as the joint committee say, it is hardly reasonable that the centre of one of the most attractive portions of the metropolitan area should be forever given up to a use for which many less attractive spots are equally available. The destruction of the beauty of small rivers running through crowded neighborhoods seems almost inevitable, and it is impossible to preserve the natural charm of the banks without restricting important business and trade. The simple question, as the report puts it, is whether the preservation of the lovely landscapes of the Charles River will be worth to the community what it originally cost, together with the expense of supervising it.

It is clear that if the river-banks are owned by numerous private persons the scenery will ultimately be ruined. Granting that many of the river-side industries are to remain where they are, the landscape-architects suggest two ways of treating the remaining private property on the river. In the first place, as in parkways on land, a building limit along the bank may be made, with certain restrictions to prevent the felling of trees between the water and the building line without permission. This would provide rather a wide strip of land with private boat-houses and landings under special permit, and, although the general public would acquire no right to the land, a commission might preserve much of the local scenery without depriving the owners of country-seats of their privacy or the possession of a portion of the river-bank. A more thoroughgoing way would be to acquire for public use the actual fee of the private river-banks. Under this scheme the boundaries of the banks on either side ought to be streets which provide frontages for houses built to face the public domain. Spaces of varying width between the streets and the water could be made accessible by footpaths, while the lands as well as the waters controlled by the governing commission would be continually policed. Such a possession of the river-bank would greatly increase the possible enjoyment of the people of the metropolitan district, for to follow on foot the meandering shore of a pretty stream is almost as delightful as to float with its current, and it is pleasant to have the privilege of landing anywhere from one's boat.

The report of the joint committee recommends the following steps as imperative:

(1) That the high-water surface of the Charles River from the dam at Watertown up to the Dedham line should be made a portion of the Metropolitan Park System; that measures should be taken to secure a water-level as nearly permanent as possible throughout the warmer months of the year; that arrangements should be made for the convenient transfer of boats over the dams. (2) That certain lands be taken upon the banks of the river for places of public resort and convenience, and that rights be taken in all the remaining frontage on the river for the purpose of preventing obnoxious uses of the same. (3) That the whole area so secured be placed under the control of some public authority having power to protect and improve it.

It will be seen that this report adopts a combination between the methods of restriction and complete ownership of the land. We have no space here to follow the convincing argument by which the joint committee justify their conclusions. Indeed, throughout this notice we have only given the outlines of a project which seems to transform a difficulty into an opportunity for providing a novel and valuable addition to the facilities of a great city for public recreation. There is an admirable map in connection with the report, with statistical tables of great value, and an interesting paper, by Dr. Thomas, on the problem of public health as affected by the stream. Altogether, the report is worthy of a place in the series of instructive public documents that have been published within late years in reference to the park work about Boston, and it is fruitful in suggestions which ought to be of use to all persons who are interested, officially or otherwise, in providing or maintaining public pleasure grounds for the people of our cities.

Trees in Visalia, California.

VISALIA, in Tulare County, is a very interesting town and district. The soil is of extreme fertility, watered by streams from the Sierras, and the growth of trees and plants is surpassed in no other part of California.

This beautiful region was a vast Oak forest when the pioneer herdsmen came with their cattle, and the ground for miles was covered with almost perennial pasturage, so well watered is this country of the Kaweah delta. Many of the great Oaks (mainly Quercus lobata) still remain. One of the finest of these, about eight miles from Visalia, is forty-eight feet in circumference close to the ground; thirty-four feet, measured five feet up, and 158 feet high. This is certainly a notable Oak, well worth going on record with some that Garden and Forest has hitherto listed. The park-like Oak groves are as stately as any in California, and some of them will probably long remain, as the land is more valuable in its present condition for dairying than if wholly cleared.

In the town of Visalia are some very choice specimens of single trees. The very largest and most striking Cedar of Lebanon known to me in California is in the grounds of Mr. R. E. Hyde. This noble tree is not less than seventy-five feet high, and the trunk girths about four and a half feet. It is loaded with cones and has borne seed for, I think, two seasons. Its age is probably twenty-five years from seed, having been planted twenty-three years here. The very rapid growth of this tree will hardly be understood by eastern readers, and is, indeed, difficult of belief, but the mild climate, rich soil, long growing season and abundant water are, of course, the determining factors. It stands in a bed of leaf-mold and decayed vegetable matter of unknown depth, brought down by the Sierra rivers into this great inland delta.

A very large Cork Oak formerly stood in the Visalia court-house yard. This was grown from acorns sent out by the Department of Agriculture some thirty years ago. The construction of a new building made it seem necessary to the authorities to cut down this noble exotic Oak, and so Visalia lost its most historic tree. Mr. Hyde's Cedar of Lebanon is now, it seems to me, the finest single tree of any species planted in the San Joaquin valley since its occupation by Americans. The finest tree of Spanish planting is probably the great Porterville Fig-tree.

The orchards of the Visalia region are justly celebrated throughout California. Peach and Apricot trees yield profits the third year after planting. One gentleman told me that he picked from two Apricot-trees 1,684 pounds of salable fruit and also dried 800 pounds of fruit that was too ripe to ship, making a total of 2,484 pounds. A three-year-old Peach-tree yielded 324 pounds, and a Plum-tree of the same age bore eighty-seven pounds. I have seen orchards here in good bearing condition that averaged 600 pounds to each Peach-tree, and from 800 to 1,000 pounds to each Prune-tree. These are low estimates, as whole rows of trees bear more than this. Prunus Simoni comes to greater perfection here than in most other parts of California, and at present the demand for shipment can hardly be supplied. Even old California fruit-growers, however, know little about the Visalia district, as it is reached only by small branch railroads from the main line, and has only begun to come into notice during the past few years. It is expected that this town will be on the main line of the new Valley Railroad, and it will probably receive more attention in the future. It is certainly a very prosperous district, a vast green-islanded oasis in the midst of less improved territory.

Niles, Calif. *Charles H. Shinn.*

The Sand Dunes of Northern Indiana and their Flora.—III.

TAKING the proper fruticose vegetation, we find Cornus Baileyi one of the first to appear upon a forming dune. It grows on when partly buried in the sand, forming new adventitious roots while lengthening its subaerial parts. It may be accompanied by the Red Osier, which is common beside the sloughs and in the damper hollows. The stems of these shrubs sometimes have a mottled look, or are strongly contrasted in color on opposite sides, the sharp sand driven against the windward side wearing off the bright-colored bark wholly or in spots, and exposing a polished surface of the green and freshly growing inner bark. In company with these will be found two Willows, Salix adenophylla and S. glaucophylla, the latter often more abundant than Bailey's Cornel. Both are similar to these Cornels in their mode of growth. The Gland-leaved Willow is the more venturesome of the two, early showing its gray tomentose leaves on some solitary stem or small cluster which has sprung up in sand quite free from other shrubs. S. lucida and S. cordata are not as common, but add to the variety of the more open dunes. The Prairie Willow, S. humilis, and the Dwarf Gray Willow, S. tristis, are not uncommon on the more sheltered dunes, where the scanty shade allows their ready growth. The Sand Cherry, Prunus pumila, ranks with the shrubs, early taking possession of the dunes. Two of the Grapevines, Vitis cordifolia and V. æstivalis, follow not long afterward. Finding little or no support, the stems lie upon the ground, their free extremities easily moved about by the wind, but serving well to protect the underlying sand by their ample foliage. With these we may place the Bearberry, Arctostaphylos, whose habitually prostrate stems serve a similar purpose. The running form of the Poison Ivy, with subterranean stems a little below the surface, and frequent branches rising a foot or two above it, grows in the same localities. When the large upright shrubs and trees appear, not only do the Grapevines become more frequent, but other climbing shrubs. The most common of these is Celastrus scandens, which festoons many spots with its bright green leaves. Another is Smilax hispida, whose prickly stems are occasionally seen. Both of these may also take the prostrate form, or manifest their climbing habit by arching or twisting stems. The Fragrant Sumach, Rhus aromatica, is well adapted to these exposed positions, and often has its straggling stems and branches partly covered by the sand heaped about

them. R. copallina is also common, and the Staghorn Sumach occasional.

The Sweet Viburnum, V. Lentago, does well in quite exposed positions, and grows to a goodly height when protected by the brow of a hill or a wind-break of trees. The Maple-leaved Viburnum and the round-leaved Cornel, C. circinata, are often encountered in the shelter of the woods, being shrubs of similar habits. With them grows the Witch Hazel, but less abundant. The Hop Tree, Ptelea trifoliata, and an arborescent Hackberry, Celtis occidentalis, var. pumila, grow near the shore of the lake. The Hackberry has straggling, subspinescent branches and ascending or spreading stems, which are sometimes fifteen feet or more in length. They form dense clumps with the aspect of a scraggy Thornbush, and a general appearance so unlike that of the common Hackberry as to be hardly recognized as the same species. In the fall they are sparsely provided with dark brown or purplish drupes, the thin sweet flesh orange-colored within. The common Juniper, though more abundant on the lower dunes, is equally at home upon the higher. Its prostrate stems and dense ascending branches, thickly covered with leaves, form one of the best protectors for the underlying sand when it has once become established.

Rosa blanda and R. humilis are among the first of the smaller shrubs to appear on the dunes, and can be found growing in sands where other kinds of vegetation are quite scanty. They blossom when but six or eight inches high, and the common height in these dry localities scarcely exceeds a foot. The stems also are very apt to be supplied with prickles. The Huckleberries and Blueberries are in great abundance. Gaylussacia resinosa and Vaccinium vacillans require more protected spots for their successful starting than the Roses, but when established cover extensive areas of open land upon the hills or their sloping sides, and are spread abundantly throughout the less densely wooded tracts. Vaccinium Pennsylvanicum is less common on the high sand hills, as it takes more naturally to the lower sand ridges or skirts the bases of the hills nearer the supplies of water. New Jersey Tea, Ceanothus Americanus, grows promiscuously with the Huckleberries, and sometimes appears in plots which are handsome and effective, both for their numerous racemes of white flowers and bright green foliage. They also preserve their leaves very late in autumn, looking fresh and green after most of the deciduous shrubs have yielded to the frost. All of these small shrubs have a stoloniferous habit, and when fires sweep over them and destroy their exposed portion the subterranean shoot-axes at once renew their stems, which quickly reclothe the ground. They are among the most effective agencies in maintaining the fixity of a dune. Diervilla trifida is another pretty little shrub which mainly hugs the bases of the trees or keeps in sheltered spots. To these must be added the humblest shrub of the sand dunes, Hudsonia tomentosa, whose prostrate stems, densely covered with fine gray leaves, delight in the most exposed positions in the sand, just as they elsewhere take to the rocks.

Chicago, Ill. *E. J. Hill.*

Foreign Correspondence.

Climbing Plants for Tropical Houses.

THE value of climbers for furnishing plant-houses, apart from the attractiveness of the plants themselves, is recognized in many good gardens. They drape the rafters, clothe the pillars and afford shade most effectively when employed with an eye to their habit of growth. The difference between a plant-house devoted to decorative gardening, the roof of which is clothed with elegant climbers, and one in which they are not used is too striking to call for comment. I have seen most picturesque improvements made in conservatories by the mere addition of a few roof-climbers, the shoots of which were allowed to hang loosely. The ugliness of a conservatory roof unfurnished with some drapery of this sort is unpardonable. Climbers are sometimes so cribbed and confined by close tying and severe pruning that they do comparatively little toward roof embellishment. Even those plants whose stems are stiff and require to be allowed to grow near the glass to induce them to flower may be made more interesting and useful by releasing the stems and even adding small lead-weights to pull them down while in bloom. Solanum Wendlandii, Allamandas, Clerodendrons, are cases in point. If allowed to grow their own way their flowers develop close to the glass where they are scarcely to be seen from below, whereas an ounce or so of thin lead neatly coiled round the stalk of the raceme when in bud causes it to hang so that when the flowers expand they are in full view. These are details, but their observance makes all the difference between good and bad effect.

Pruning also requires to be done with an eye to the peculiar nature of the plant, and especially to its season and method of flowering. Plants which flower on the young shoots of the current year should be pruned immediately after the flowers have faded. Such plants are the Bignonias, Clerodendrons and Hexacentris. On the other hand, plants which flower on the ripened wood of the previous year's growth should be thinned rather than pruned, and the strongest shoots cut out annually. Of course, many climbers practically prune themselves, or their stems are deciduous.

Almost every one of the tropical climbers named here enjoys a liberal allowance of sunshine. At Kew in the large houses they get no shade whatever, and they grow well and flower freely. Climbers naturally make for the tops of trees where they can enjoy the sunshine. One might say they are climbers because they want sunshine, which in a state of nature they can only obtain by scrambling up and over whatever happens to keep the light from them.

Climbers are a special feature in the large houses at Kew, and this year, owing, no doubt, to the excessive amount of bright sunshine experienced during the summer months, they have flowered profusely, giving the roofs of some of the houses a pleasing and interesting appearance. Many of the plants grown in a botanical establishment are deficient in decorative characters, and this is true of a large proportion of the climbers to be seen in the houses at Kew. But they are all interesting in a botanical sense, and a list of all the climbers grown at Kew would, no doubt, be of some value. Here, however, I propose to name only those plants which are easily grown, flower freely, and when in flower are decidedly ornamental. Some of them are popular favorites, while others are as yet grown only by the few; they are all plants that merit a place among select climbers for tropical conservatories.

ARISTOLOCHIAS.—The best of these are Aristolochia gigas Sturtevantii, which for the last month has been a source of as much interest and enjoyment to visitors as the Victoria regia, over which the Aristolochia stems have festooned themselves and now develop their enormous flowers half a dozen or more at a time. A. elegans is a delightful little plant for a pillar or a rafter in a small house, and A. hians, with its bright green kidney-shaped leaves and elegant bird-like flowers colored creamy white, with purple-brown veins, is a more useful plant than its near and more robust ally, A. Brasiliensis.

ALLAMANDAS.—In addition to the forms of Allamanda neriifolia, of which A. Hendersoni, Chelsoni and Williamsii are the best, there is the thin-stemmed, small-leaved A. grandiflora, which bears elegant trumpet-shaped flowers of the richest canary-yellow color. It grows weakly when on its own roots, but is robust and healthy when grafted on A. neriifolia.

ANEMOPÆGMA RACEMOSUM (Bignonia Chamberlainii) is a stout, vigorous grower, its stems attaining a length of twenty or thirty feet in a few months, which in the autumn are clothed with axillary clusters of soft yellow Bignonia-like flowers. A. denocalymna nitidum and A. comosum are near

allies of similar habit and larger flowers of a darker shade of yellow. These are three good-natured plants, growing and flowering freely under even makeshift treatment.

Bignonias.—These include the popular Bignonia speciosa and B. purpurea, the latter a beautiful summer-flowering climber with flowers of a rich purple color. B. Tweediana has small leaves, and its numerous shoots hang elegantly so as to form a screen or curtain which in summer is studded with large golden-yellow flowers. B. venusta is a glorious plant when happily situated in a sunny intermediate house, producing large racemes of bright scarlet flowers.

Bougainvilleas. — We have now four distinct sorts, namely, Bougainvillea spectabilis and its variety lateritia, and B. glabra and its floriferous form named Sanderiana. These are essentially sun-loving plants, and when in suitable positions they make a magnificent and lasting display during the summer.

Clerodendrons.—Most stove collections contain Clerodendron Thomsonæ and the hybrid C. speciosum, but the bright blood-red C. splendens is a rare plant as yet. C. volubile, with very dark crimson flowers, is also rare. Trained to three or four wires stretched parallel with a rafter and grown on what is called the short-spur system, these plants form most effective masses of flowers.

Dipladenias.—These should be grown in a hot moist house and their stems trained on strings till the flower-buds appear, when they may be transferred to a show house and trained round pillars or in any position where their beautiful flowers may be seen. They are now a great attraction in one of the stoves at Kew. Dipladenias require very sandy peat and should be potted lightly. They cannot bear sourness of soil or excessive watering. After flowering they should be rested in a dry house.

Passifloras.—The best of these now in flower at Kew are Passiflora alata, flowers four inches across, crimson, with a very conspicuous blue and white corona; P. racemosa (princeps), with pendent racemes of brick-red flowers; P. Raddiana (Kermesina), a most elegant little plant with bright crimson flowers; P. Watsoni, of similar habit to the last, the flowers of two shades of lavender and very fragrant; P. violacea, with flowers as large as those of P. cœrulea, colored violet-purple, with an almost black corona; P. vitifolia, with scarlet flowers.

Thunbergia laurifolia, T. grandiflora and its white-flowered variety are three first-rate plants for producing bold effects of foliage and flower. Their ally, Hexacentris Mysorensis, is a superb plant for a rafter, its thin, pliant stems being easily trained or festooned, and the long, graceful, pendent racemes of orange-red and yellow flowers being exceptionally charming.

Ipomœa ternata.—Three distinct plants are included under this name, all of them first-rate garden plants. They are what are known in gardens as Ipomœa Horsfalliæ, with flowers in clusters and colored rich crimson; I. Thompsoni, sometimes called the White Horsfalliæ, and I. Lady Briggs, which has smaller brighter-colored flowers than the last-named and is more easily managed. It flowers in midwinter and is a most useful stove-plant. I. paniculata (Batatas), with annual stems and large rosy-mauve flowers; I. tuberosa, somewhat similar in growth to the last, but yellow-flowered, and I. rubro-cœrulea, the winter-flowering stove annual, which every one grows or ought to grow, are the best of the Ipomœas.

Beaumontia grandiflora.—This large woody climber grows freely under ordinary stove treatment, but it does not always flower satisfactorily. I have never seen it flowered well near London, and I attribute this to the bad effects of fog upon the flowers in winter. But in gardens in the country I have seen plants heavily laden with enormous clusters of large trumpet-shaped, pure white, fragrant flowers, quite equal in elegance and purity to those of Lilium longiflorum.

Mucuna atropurpurea is a vigorous climber, not unlike a Scarlet Runner, and its black-purple flowers are borne in clusters on slender drooping stalks in such a manner as to resemble large bunches of grapes.

Oxera pulchella is allied to the Clerodendrons and produces large axillary racemes of white tubular flowers. Roupellia grata, the Cream-fruit of Madagascar, has shining Laurel-like leaves and Allamanda-like flowers of a dark crimson and yellow color. Gmelina hystrix has the habit of Bougainvillea, and bears large, yellow trumpet-shaped flowers in clusters springing from a cone-like arrangement of large brown-purple bracts. Solandra grandiflora grows rampantly in any tropical house, but only develops its large white Datura-like trumpets when exposed to bright sunshine in a rather dry house. Gloriosa is a beautiful little genus, and when properly managed its elegant spider-like red and yellow flowers are very attractive. Clitoria ternata is worth growing in every stove for the sake of the rich gentian-blue of its large pea-like flowers. Arauja grandiflora (Schubertia) is as effective as Stephanotis floribunda, and is as easily grown. Stigmaphyllon ciliatum and the Manettias bicolor and cordifolia also deserve mention for their free growth and attractive flowers.

London. *W. Watson.*

Plant Notes.

Evonymus obovatus.

THIS plant, which is a native of Canada and of the northern and middle states, has usually been considered a form of Evonymus Americanus. It differs, however, from that species in its prostrate or semiprostrate branches, much smaller and earlier flowers, and, as Nuttall pointed out in his *Genera of North American Plants*, is best considered a species.

Evonymus obovatus has been used with excellent effect in the Arnold Arboretum to form a carpet under larger plants and to border the margins of shrub-beds. It grows well in the shade and the full light of the sun. Its cheerful light yellow-green foliage is attractive throughout the season; it is very hardy, free from insect enemies, and when once established grows rapidly into broad dense mats of long, spreading, slender stems. The purple flowers are not conspicuous, but they are followed by fruit covered with prickles and seeds surrounded by showy scarlet arils.

Our illustration, on page 385 of this issue, will, perhaps, serve to attract the attention of gardeners to the horticultural value of this much-neglected shrub.

Physalis Francheti. — Last year Mr. Watson spoke of this as a beautiful border plant with Chinese-lantern-like fruits of a bright orange-red. Early this year we called attention to a colored illustration of it in *The Garden*, in which the brilliant balloon-shaped calyx, seven or eight inches in circumference, made a striking picture, and these fairy-like balloons were said to remain bright after they had been cut a year. It is a near relative of the old-fashioned Winter Cherry, Physalis Alkekengi, which is not at all uncommon in American gardens, and it was introduced by the Veitches, of Chelsea, from Japan in 1894. Mr. Michael Barker writes that seeds of the same plant were also received from Japan by Mr. John Lewis Childs, of Floral Park, where it has been grown extensively and proves to be a meritorious plant. In Mr. Childs' garden it grows from twelve to eighteen inches high, erect and densely branched with smooth stems well furnished with ovate, acuminate leaves, the largest of which are six inches long. The dull white flowers with greenish centre are not showy, and are borne singly on short pedicels in the axils of the leaves. The inflated calyces are three inches in diameter when fully grown, and they then turn from their original to the vivid colors we have described. Since it is said to be hardy in England it is probable that the new plant is a perennial like P. Alkekengi, but it has been treated by Mr. Childs so far as an annual, and its hardiness and duration here remain to be tested. Plants raised under cover and set out in the open

Fig. 51.—Evonymus obovatus.—See page 384.

ground as early as the weather will permit produce from the axils of almost every leaf their large and glowing calyces from the latter part of August onward.

CARPINUS CAROLINIANA.—The American Hornbeam, in some places called the Blue Beech or Water Beech, is found along the banks of streams from the Dominion of Canada to Florida, and reaches its greatest size in the southern Appalachian region and in eastern Texas and

southern Arkansas, where it is sometimes forty feet high, with a trunk two feet in diameter. It is usually a smaller, closely branched, spreading tree with smooth, close, gray bark and a stem that is fluted and furrowed in a picturesque way. The leaves are dark bluish green in summer, and turn to orange and scarlet late in autumn. Altogether, this Hornbeam, with its airy and graceful crown, is one of the best of the trees of its size for use in our parks and gardens. Like many American trees, it has been neglected by planters, and the European Hornbeam, Carpinus Betula, was more commonly planted twenty-five years ago, but our native tree is now obtainable in any good nursery. An Asiatic variety, C. Duinensis, has been occasionally grown here, and some distinct and beautiful species in Japan, notably C. cordata, have been figured in this journal (see vol. viii., p. 295, and vol. vi., p. 365).

Cultural Department.

Shrubs with Ornamental Fruit.

I NEVER saw the shrubs which are valuable for their ornamental fruit more beautiful here than they are this season. The bush Honeysuckles all summer long have been exceptionally pleasing, and hundreds of people who drive by them stop to express their admiration. Among the best were Lonicera orientalis, with black and blue fruit; L. chrysantha, from the mountains of Pekin, with fruit as red as coral; L. Morrowi, with deep purplish crimson fruit; L. Bella rosea, with fruit cherry-red, and the different varieties of L. Tatarica, with fruit violet, yellow and other shades of color that it will be hard to describe.

Of the Viburnums the first to ripen fruit was V. Lantana and its variety macrophylla, with berries at first green, then turning into a light rosy pink, and through cherry-red to a true black when fully ripe. The plant has an ever-varying charm which gives it singular value from its flowering season until the end. V. acerifolium is also now conspicuous with its purplish fruit; V. Opulus, with its brilliant orange and scarlet fruit according to its age; V. dilatatum, from Japan, with large corymbs of dark red fruit, which later becomes scarlet; V. dentatum, with blue fruit; V. molle, with much larger fruit and also bright blue, and V. Lentago, with fruit blue-black.

Of the Cotoneasters, C. latiflora has brilliant scarlet fruit; that of C. vulgaris is nearly black, while C. acuminata has deep purple fruit. The white-fruited varieties of Symphoricarpus are now in their prime, and I think the species called S. mollis much finer than S. racemosa. The berries are clear white, but more abundant and larger, while the plant is more graceful in its habit. The Spice-bush is now a striking shrub with its scarlet fruit and its leaves changing to yellow. The variety obovatus of Evonymus Americanus was never as handsome as it is this year. It is a low shrub, planted here on a bank which is somewhat shaded, and being of a trailing habit it has covered the ground, and it now bears much scarlet and orange fruit, which makes a very pretty combination (see p. 385).

The Cornuses are all fruiting well. C. candidissima was especially beautiful with its scattering bunches of pure white fruit; C. mascula is just dropping its brilliant cherry-red fruit; C. sericea is covered with its fruits, now blue, then white, while C. stolonifera and C. Baileyi have clustered fruits of pearly white. Of the climbing Honeysuckles, Lonicera Sullivantii and L. hirsuta are the finest, the fruit of the latter being purplish red, while the former is a brilliant scarlet. Ilex lævigata ripens its fruit early, which is of a brilliant scarlet, showing particularly well among the shining leaves. This, certainly, is a plant which should be more frequently cultivated in parks or gardens, as it is beautiful at all seasons.

Arnold Arboretum. *Jackson Dawson.*

Seasonable Work.

THE housing of tender plants now demands attention, for a severe chill is almost as injurious to plants of this character as actual exposure to frost. Among the first to suffer are plants of Poinsettia pulcherrima that have flourished outdoors during the summer, their growth being stunted and lower leaves likely to drop off if once chilled. While this injury may not entirely prevent the formation of their brilliant bracts, it will do much toward ruining their usefulness for conservatory decoration. Cyclamens also are affected by chilly nights when growing in cold frames, and are much more under control in a light greenhouse in which a temperature of fifty-five degrees can be maintained. Aphides are likely to be troublesome on Cyclamens at this time, unless the precaution is taken to spread chopped tobacco-stems among the pots. This method disposes of these pests quite as effectually as smoking, and with less risk of injury to the foliage or flower-buds.

Bouvardias, Stevias and Eupatoriums should also be indoors by this time. Nothing is gained by keeping them out later, and their flowers will soon be needed to keep up a regular supply. Begonias that have been grown outside in readiness for winter flowering in the greenhouse should also be brought under cover soon after September 1st. These are, almost without exception, heat-loving plants, and are liable to lose some of their roots from a chill. If one is limited in the choice of Begonias, three of the most useful species are B. incarnata, B. Saundersii and B. corallina, all of which are easy to manage and extremely free in flowering.

The main crop of Carnations in many establishments has, doubtless, been housed before this time, but there is usually some surplus stock after the first selection has been made, and if space can be spared for these in a protected frame, they can be held in reserve until later in the season, when, as pot plants, they will prove useful in filling up spaces formerly occupied by Chrysanthemums.

Crotons that have been bedded out (and it may here be noted that their use in this capacity in the vicinity of Philadelphia has again proved highly satisfactory) should soon be lifted, and may be repotted into as small pots as their abundant roots will permit. After becoming established in the greenhouse, they will provide a crop of highly colored cuttings that will make first-rate stock for the following spring.

The various bulbs for winter and spring forcing are arriving now, and these bulbs should be got under ground as soon as possible after they are received, for many of them suffer considerably from over-exposure to the air and light. The earliest, Lilium Harrisii, have probably been potted more than a month, and should now be well-rooted and showing their growths above the soil. For Easter decoration I prefer Lilium longiflorum, but this variety does not like hard forcing, and, therefore, L. Harrisii is preferable for early work. If the Lilies are not required to bloom before spring they can be kept in a cold frame having plenty of ventilation, until October 1st at least, and a stouter and stocky growth is thus secured.

A special point to be borne in mind in the treatment of all plants that have recently been brought in from outdoors, is that they still need plenty of fresh air, and, therefore, more or less ventilation should be given during the night as well as the day, in order to avoid a soft and spindling growth.

Holmesburg, Pa. *W. H. Taplin.*

Chrysanthemums.

CHRYSANTHEMUMS for specimen plants are now in shape, and the earliest varieties will soon show their flower-buds. Some additional tying will be necessary now. All stray shoots should be pulled into place, so that nearly a globular shape is secured. It is not an easy matter to do this work when the shoots begin to ripen and buds appear, for the reasons that they are less pliable and there is danger of injury to the tips of the shoots. No matter how careful one may be, some of the soft tips are sure to be broken when there is not sufficient time to replace them. A few finishing touches will be necessary a week or so before the exhibitions, but as little as possible should be left until then.

Plants in the open ground should be taken up at once. Cultivation in the open implies more or less naturally grown plants. It will be impossible to get such plants into shape for exhibition purposes, and no matter how carefully the work is done they will lack the trim appearance of continuously trained specimens. But naturally grown plants have a charm all their own. Severely trained specimens impress many persons in the same way as pattern flower-beds. They are too "artistic" or artificial. Unfortunately, untrained specimens, however natural they may look, are usually poorly grown. As much skill is required to grow natural plants as trained ones. They need watching during the whole season. Superfluous growth must be thinned out and light and air let in to the centre of the plant to avoid a skeleton-like appearance, the result of crowded growth smothering the life out of the lower foliage. Attention to the details just noted will secure short, healthy growth and plenty of good foliage down to the ground. Before potting plants from the open ground a piece of string should be put about them, to hold the branches together until the work is done. It is better to stake them into shape at once, so that when they recover they will do so in good order. If

good soil is used very little manure-water will be needed, and certainly none should be applied until the pots are well filled with new roots.

Generally all the shoots on specimen plants bear what is known as terminal buds—that is, the flower-buds produced at the ends of the branches are the last ones the plant makes. They occur in clusters, and all should be carefully removed, except the leading one. The variety G. Daniels is an exception. Every shoot on this plant produces a modified crown-bud. If these buds appear well on in September, I take them —that is, allow them to grow by removing the side shoots, or terminals.

Feeding should continue until the blooms begin to show color, but in decreasing quantities and strength. All plants should be housed before there is danger of frost. A slight frost will not injure them, but there is nothing gained by delay. It is easier to control the moisture supply, and at the same time keep the air dry, when the plants are under cover. They should be dried freely, but direct draughts must be avoided, even on bright days, if at all cool, as the liability to mildew increases as the season advances. When the nights begin to get cool toward the end of September a little fire-heat will be beneficial, if only to keep the air in good circulation.

Wellesley, Mass. *T. D. Hatfield.*

Orchids in Flower.

Oncidium incurvum.—This is the period when there are fewer flowers among Orchids, and such as are in bloom are the more conspicuous and valuable. Oncidium incurvum is one that can be relied on to grow freely and to flower at this season every year; the spikes are a long time developing, often six months, but the longer they are growing the better and larger the spray, for they will sometimes be four feet in length, as we have them now, and covered with side branches that have pretty pink and white flowers that are very fragrant on bright days. It is essentially one of the plants that any one can grow where a warm greenhouse is at command. As the plant is a native of Mexico and Guatemala at considerable elevation, a tropical temperature would be fatal eventually, so a temperature of about fifty degrees in winter is ample, with plenty of air and shade in summer.

Oncidium ornithorynchum.—This is another species that will thrive under similar conditions as Oncidium incurvum, as it comes from the same localities, and, like it, has flowers that have pink shades, probably the only two in the genus where pink takes the place of the all-predominant yellow that is almost peculiar to the genus. O. ornithorynchum also has long, much-branched flower-spikes that are produced four, and sometimes more, from a single growth, and when these are covered with rosy pink flowers that are deliciously fragrant, a spicy odor that does not tire, but reminds one of Heliotrope, a well-grown plant is decidedly pleasing and a thing of beauty that lasts in good condition for a long time. There is a white variety that sometimes crops up among importations, and it is much valued when one is fortunate enough to obtain it in this way. I saw a superb specimen of it in the noted Measures collection last year that created a sensation when shown in London some time later. There is no difficulty in cultivating this species. We used to grow them in perforated pans, suspended, but when taking them out it was noticed that the roots carefully avoided the perforations and were to be found only adhering to the pan itself, so it seemed reasonable to suppose they did not grow on trees and would prefer an ordinary flower-pot, and those that were tried in this way show a decided increase in vigor; a small plant that was obtained five years ago in a four-inch pot is now a huge specimen in a pot ten inches in diameter, and will in a few days be covered with flowers. This plant grew so well that twelve more were obtained, and there is quite a variation among them as to color. These Oncidiums should never be dried off, and before the flower-spikes are much advanced the pots must be immersed in water to get out the slugs, as these are very partial to the tender-growing flower-stems.

South Lancaster, Mass. *E. O. O.*

Vegetable Notes.

Celery.—Taken as a whole this has been a very favorable season for Celery here. Little or no artificial watering has been required, and so far the plants are perfectly free from rust or spot. The early supply will now require to be earthed up, but we generally leave this until the last possible moment, as a preventive of rust. For the main crop the first week in October is early enough to begin the banking-up process, and then just enough to gather the plants into shape.

Lima Beans.—These have been rather slow in filling out, especially those toward the top of the poles, but we find that an occasional soaking with liquid-manure hastens the process. Burpee's Bush Lima proved very useful for an early supply, and, so far as we have seen, it excels all the other bush varieties. It is not quite as early as some others, but the bean is so much larger that it is well worth waiting for.

Onions.—Last year we tried the transplanting method on a small scale, and were so well pleased with the experiment that our main crop was grown in this way this year. The seeds were sown early in March in flats, and as soon as the seedlings were fit to handle they were pricked over into flats again; these were eventually transferred to frames and gradually hardened off until they were planted in the open ground about the middle of April. At the time of harvesting we had onions ranging from twelve to fourteen inches in circumference. The advantage over those sown in the open ground in the usual way was so marked that we will only grow a few of these later for pulling green in future. It may be objected to this plan that it requires more time and trouble, but this is doubtful, the sowing and handling over is done when time can be more easily spared than in the bustle of outdoor spring work; the planting out occupies no more time than the preparing of a seed bed. The ground is merely raked over, the line laid along and the plants inserted in a hole made in the soft soil by the finger. After the line is completed we run along with a foot on each side to make the whole firm and the work is completed. The thinning-out process, which takes considerable time at a busy season, is entirely done away with and weeding is much easier. Any of the varieties can be grown by this system, but for size and quality the Prizetaker leaves little to be desired.

Tomatoes.—The outdoor crop is now liable to be cut off at any time by frost, and where a continuous supply is needed a crop indoors should be ready to take its place. This planting sets freely, as a rule, but is so liable to spot that unless it is absolutely required we are inclined to omit it. The younger plants, sown about the beginning of August, will come in for Thanksgiving, and on account of the diminishing brightness of the sun will grow much healthier, and if the atmosphere is kept dry and the house carefully aired there will be little danger from spot.

Lettuce.—Lettuces are always welcome during the winter months. Successional crops may be planted in frames and a sowing made for the first crop indoors. Where space is limited, a plentiful supply can be kept up in frames till Christmas, after which, if the weather be severe, it is somewhat difficult. The old Boston Market is a reliable frame variety, but we prefer Golden Queen for greenhouse work, being less liable to damp, and it matures earlier. Where quantity is the object chiefly desired, Grand Rapids would probably be the best; though somewhat coarser in texture, the leaves are crisp and juicy, while the flavor is all that can be desired.

Tarrytown, N. Y. *William Scott.*

Primroses.—It will be noticed that the hardy species of Primula merely eke out an existence through our hot months, and when the cool night dews begin to fall, growth begins at once. We find that this is the best time to lift, divide and replant such as the Polyanthus, both double and single, and the Japanese P. Sieboldii. We grow a quantity of these hardy Primulas both in frames and outdoors for successional flowering, and find them very satisfactory. But they must be treated liberally and not allowed to remain in the same soil for more than a year. At this time the clumps are taken up, carefully divided and reset, three or four crowns together. The soil should be rich. P. Sieboldii, being deciduous and having rhizomatous roots, requires a little different handling. The roots of this Primula are spread over the surface, and they must not be covered to such a depth as to prevent the rhizomes running freely near the surface, or much of the energies of the plants will be wasted. Owing to this habit of surface-rooting it is not so essential to lift P. Sieboldii every year, but a good mulch of well-decayed leaf-mold at this time will serve as a top-dressing and also as a winter protection to any roots that may have become bared of soil through the action of the weather or use of the hose. Of all hardy Primulas, P. Sieboldii is the best we have tried. It is as bright in its way as the lovely P. rosea, from the Himalayas, and much more certain. The flowers are useful for cutting, owing to the long, erect, wiry stems. It has proved perfectly hardy here for several years past.

Lilium Wallichianum superbum (Lilium sulphureum).—I notice that this fine hardy Lily has been widely distributed of recent years, and though most of the plants seen in gardens are hardly old enough to flower, the growth made is good and promises to be healthy. This Lily seems even more anxious to reproduce itself than the old Tiger Lily. The smallest stems have young bulbs formed in the axil of nearly all of the leaves. This affords a ready and sure means of propagation, and no time should be lost now in securing them. They drop to the ground at this time and are easily lost if not gathered and planted in a box for the first year's growth. They will be slow to start, probably not before next midsummer. It is best to put them in a cool place under the benches in the greenhouse, or even in a cellar. Any anxiety on the part of a plant to reproduce itself is in most instances a sure indication of either inherited weakness or unsuitable local conditions. I am not sure yet whether this Lily is going to remain permanently as an individual, or if this habit of producing bulblets is characteristic. It appears as though it is, but there is no doubt that the plants would be strengthened by the removal of all the bulblets if it is not desired to propagate them. One bulb would soon produce enough to plant an acre if it was desired. Our original bulb was obtained three years ago, and being weak died after the first season's growth; but from its produce that year we have just gathered over a thousand bulblets, and we have enough now for all purposes. Next year all increase in this direction will be carefully guarded against, and I think the parent bulbs will be benefited thereby.

South Lancaster, Mass. *E. O. Orpet.*

Marguerite Carnations.—I consider these among the most satisfactory of half-hardy flowers. To those having a demand for cut flowers during the months of August, September and October (or till Christmas, if potted in September and placed in a cool greenhouse or frame) they are invaluable. A group of them has been flowering in this garden for the past six weeks, and to-day, September 6th, I counted on several individual plants from sixty to seventy-five well-developed buds and blossoms. A great improvement has been made in them during the past few years, and they now almost equal the greenhouse kinds both in size and fragrance. There is a wide range of color among them, and I have not found one with the calyx split. We sow the seeds in pans in a warm greenhouse about the first week in February, growing them along so as to make nice plants by planting-out time. After planting they need to be pinched once or twice to make them bushy, besides a little attention in the matter of staking and watering. They do best in an open sunny position and prefer a light rich soil.

Botanic Garden, Northampton, Mass. *Edward J. Canning.*

Two Good Roses.—In Willow Grove Park, near Philadelphia, are two beds of Roses, one of La France and one of American Beauty, and it is a pleasure to see how finely they flower. They certainly are among the best of Roses for bedding in this section. A week ago there was not a plant in either bed that did not carry one or more flowers. Many of them had half a dozen each. These Roses are perfectly hardy here, so far as their blooming is concerned. The La France may lose a few inches from the tips of the branches, but this is only a pruning which benefits it. The flowers of both are delightfully fragrant.

Pueraria Thunbergiana.—When allowed to climb over a tree or anything which allows thick massive growth, this Kudzu vine makes no floral display whatever, its flowers being hidden by the foliage. This is not the case when on a trellis or some flat surface. Then its racemes of rosy crimson flowers are well displayed. They commence to expand in the first week of September. For rapid growth this plant has no superior among climbers.

The European Medlar.—Mespilus Germanica is a plant which is not supposed to flourish in these parts, but there are small specimens near Philadelphia which are quite healthy and hardy and which bear medlars. The plant should be more widely tested.

Viburnum Lantana.—The beauty of this plant both in flower and fruit has often been referred to. Let me say that Viburnum continifolium, a Himalayan species, figured in Garden and Forest (vol. v., p. 245), is on some accounts still better, although resembling it a good deal. The flowers, foliage and fruit are on a larger scale. The fruit of V. Lantana is the later of the two to ripen.

Germantown, Pa. *Joseph Meehan.*

Correspondence.

Notes from Southern California.

To the Editor of Garden and Forest:

Sir,—During the month of June, Calochortus Plummeræ is in season, the last of the genus to flower in this region, and though not as showy as some species, it is very attractive. The flowers are of a rich lavender-purple of many shades, with yellow hairs at the base of the petals. I once found a dead stalk which was four and a half feet high and had borne ten flowers. The usual height is from two to three feet. It is found on high hills and ridges, where it is quite dry at the time of flowering. If the stalks are cut when the buds are nearly mature and placed in water in the house they expand beautifully and produce larger flowers than if left on the plant. In rare instances I have found plants bearing flowers of a pleasing shade of salmon pink.

During the latter part of June and early July is the season for Delphinium cardinale. To come upon a large group of this plant in full bloom for the first time is an event never to be forgotten. I first saw a mass of these plants in the distance from the top of a hill. Descending, I came upon them in such a position that the rays of the setting sun intensified the brilliancy of their fiery orange-scarlet color. It has been said that to some persons a red color suggests the sound of a trumpet. Such a one would here have heard the blare of a thousand trumpets. I gathered a large armful of stalks from three to seven feet high, and on reaching home placed them in a Mexican water-jar standing upon the floor. With the addition of some fine stalks of the lovely white Romneya, the starry white flowers of the "Soap-plant" and some tall wild Grasses, a floral piece was made which might please the most fastidious. The Delphinium-flowers continue to expand for several weeks in water. The roots endure great drought, becoming brittle as pipe-stems, yet starting readily on the arrival of the rainy season. It flourishes only in sandy or decayed granite soil.

It is interesting to note the variation in color of some California plants. Mimulus viscosus in the type has flowers of a rich buff-orange. In the high mountains a form is found with primrose-yellow flowers, and in one instance I found a plant bearing flowers of a French white, and in another locality a plant bearing flowers of a brilliant rust-red, a most distinct and pleasing shade. In rare instances plants of the type are seen in our gardens, where they flower throughout the year.

One of the most notable sights in southern California gardens in summer-time is the Australian Flame-tree, Brachychiton acerifolium, in full flower. In the garden of Mr. C. H. Richardson, of Pasadena, is probably the finest specimen in this region. The tree is of fine pyramidal shape and about twenty-five feet high. At the time of flowering it is entirely destitute of foliage, but is literally covered with bloom. Every branch and twig is terminated by loose spikes of flowers about half an inch in diameter, in shape somewhat resembling Lily-of-the-valley. Their color is the brightest vermilion. Such a gorgeous spectacle is worth a long journey to see. At all other times the tree is covered with rich green foliage and is very ornamental.

I will bring this "scarlet letter" to an end by noting that I have succeeded in flowering the rare Gerbera Jamesoni, from south Africa. The plant is not yet well established, but produced a solitary flower two and a half inches across. The rays were somewhat narrow, but otherwise the flower resembled a Marguerite or a field Daisy. It was of a bright orange-scarlet color and very handsome. This color is very rare in the Compositæ, and should the plant prove a good grower here it will be a welcome addition to our gardens.

Los Angeles, Calif. *Edmund D. Sturtevant.*

Utilizing Choke Cherries.

To the Editor of Garden and Forest:

Sir,—The Choke Cherry grows abundantly about here, along fence rows and in the edges of woods. It seems to have a preference for sandy soils. In certain favorable locations it bears enormous crops of fruit. Certain plants seem to be more prolific than others, and there is a noticeable amount of variation in the size and quality of the fruit. Frequently one will find clumps of bushes from which several bushels of really fine fruit might be gathered. For the most part, however, it entirely goes to waste. It is not even used by the birds or the curculios. It seems really a pity to see so much fine fruit spoiling unused.

For the sake of seeing what might be done with this fruit, a quantity was taken this summer and made up into jelly. The result was gratifying. There was not a large amount of the jelly, but the quality was superior. The clean flavor of the bitter almond characterized our samples, which were sweet and fruity besides. The flavor was altogether desirable. The texture was somewhat coarse and grainy, owing, perhaps, to the fact that the fruit was overripe. The jelly was also dark-colored, probably owing to the same fact.

There are many places, in this vicinity at any rate, where the fruit of the Choke Cherry could be picked in large quantities with ease; and, so far as the result of our small experiment may indicate, it would be altogether worth while to gather it and make it up into jelly.

Vermont Experiment Station. *F. A. Waugh.*

The Forest.

The Burma Teak Forests.—VIII.

LINEAR VALUATION SURVEYS.

THE reader may justly ask, what can possibly be the object of filling the pages of GARDEN AND FOREST with these dry facts and figures relating to Teak in Burma, a tree which does not grow in the United States, and which could not possibly be grown as a forest tree if the attempt were made?

American foresters are practical people, and though some of them, doubtless, honestly desire to manage their forests upon conservancy principles, they naturally are impatient and wish to attain results as speedily as possible. It being known that the system of linear valuation surveys made it possible forty years ago in the Teak forests of Burma to organize the working of these forests on a plan which has stood the test of experience, it is but natural that the adoption of a similar system in the United States should have been contemplated. Hence, it may not be out of place to explain the conditions under which the adoption of that system would not be advisable. In forests where one species predominates, such as the Redwood forests of California, or where the constituent species are all marketable, it will generally be found most convenient at the outset, and before special working plans are made, to regulate cuttings by area. In such cases each forest division would be divided into a number of blocks of approximately similar productiveness, one block being taken in hand annually for the cutting and extraction of the mature and marketable timber in it. What proportion of the marketable trees should be cut, and the selection of the trees to be felled, must depend upon what is known regarding the natural regeneration of the forest, the rate of growth and other considerations. The main point, as a matter of course in all cases, must be so to arrange cuttings as to ensure the maintenance and the regeneration of the forest. In forests, on the other hand, where the marketable kinds only form a small proportion of the growing stock, it will often be difficult to regulate cuttings by area, and in such cases it may be expedient to endeavor, by means of linear valuation surveys, to obtain a general idea regarding the growing stock of the different age classes, and, guided by the results thus obtained, to regulate the cuttings by volume—that is, to fix a maximum number of trees to be cut annually within a certain area. In Burma no other method was possible at the outset, but elsewhere circumstances may be different. Thus, in the Alleghanies, where the Yellow Poplar is the most valuable, and may in places at present be the only marketable species, this tree may possibly be found in scattered patches of varying extent, Liriodendron being the principal tree in these woods or patches, while in the remaining forest area this species would be absent, or nearly so. In that case the results of linear surveys would be misleading, and other methods must be devised. In any case it should be distinctly understood that linear valuation surveys were employed in Burma at the outset only, and that when special working plans were prepared for forest districts of moderate size the estimate of the growing stock was formed on the ground of sample areas carefully selected, so as to represent approximately the constitution of the entire forest.

WORKS OF IMPROVEMENT—CUTTING OF CLIMBERS.

It has been shown that the condition of those forest tracts in lower Burma which have lately been examined in detail, and which, therefore, are best known, has greatly improved as far as Teak is concerned, particularly as regards the younger classes. This improvement could not have taken place had not girdling operations been made sparingly and had not the selection of the trees girdled been governed by correct principles. This favorable result is, however, also due to the works of improvement that were undertaken—that is, to the care bestowed specially upon the Teak in the forests. One of the features which at once struck me forcibly in those forests was the large number of huge woody climbers, the stems not seldom one hundred feet long, as thick as a man's leg, but as flexible as a rope, their tops twisting round stem and branches of Teak and other trees, and their luxuriant foliage smothering the crown of the trees on which the creeper had settled. Botanically, these creepers are most interesting; they belong to a large number of families, many bear a profusion of gorgeous flowers; in all of them the structure of the stem, the circulation of the sap and their mode of growth and development present interesting and most important problems, but the mischief they do is very great. The tree to which one of these woody climbers has attached itself gets bent, forked and twisted; it is badly shaped, remains stunted and is often killed. Hence, I determined at once that these pests should be destroyed throughout the Teak-producing tracts. Fortunately, this work is not difficult; the stems of these creepers are soft, and I soon found that it gave my Burmese companions considerable pleasure to cut them with their long, stout, sabre-like knives. The rule which I established was that when girdling operations were carried on in any district all climbers on Teak-trees should be cut, and it was made the duty of the local native foresters to keep the Teak in their districts clear of creepers.

The battle which I waged against creepers in Burma has not, it is true, led to a complete extirpation of these interesting plants. Readers of GARDEN AND FOREST will still be able to see a good many of them should they visit the forests of Burma. More perfect success was attained in this respect in another part of India at a later date, under my advice, by my younger friends in the forests. In 1875 a valued friend of mine came from England to see how India was progressing, and, among other things, to understand what we were doing in the forests. At that time I happened to be in the Dèhra Dûû, a large forest district mainly consisting of Sàl, Shorea robusta, at the foot of the Himalaya. Ever since I had first visited these forests in 1863 I had resolved at that place to establish a forest school for the natives of India. I had, however, determined not to take any steps in this direction until my friends, who had charge of these forests, should have succeeded in bringing them under efficient protection and a regular system of management. Example is better than precept, had been my motto all through my Indian career, and I had determined that the training at that school should be chiefly practical. This, however, was impossible without forests in good condition and under systematic management as the training-ground for the students. In 1878 I succeeded in obtaining the sanction of the Government of India to the establishment of the Dèhra Dûû Forest School, but in 1875 considerable progress had already been made in the improvement of the forests.

My friend took a special interest in botanical matters, and I naturally wished to show him some of the gigantic climbers of the forests—Butea superba, with its gorgeous orange-colored flowers; Bauhinia Vahlii, with its irregularly ridged and furrowed stem, its impenetrable net-work of twigs and branches and its dense foliage. Not one was to be found; they had all been carefully extirpated. My friend, now the Right Honorable Sir Mountstuart Elphinstone Grant Duff, saw that the forests were well cared for, but the readers of GARDEN AND FOREST will sympathize with his disappointment at not seeing either Bauhinia Vahlii or Butea superba hard at work throttling the Sàl-tree.

More difficult to deal with were Epiphytic ficus, the seed of which germinates on a branch or in a fork of the tree. The Epiphyte at first grows very slowly, but afterward draws abundant nourishment from aërial roots sent down into the ground, and finally tightly encloses the trunk of the Teak or other trees with a net-work of anastomozing roots, forming a thick woody sheath round the stem. Another important work that was undertaken, to favor the development of the Teak-tree, was to cut down or to girdle other trees overshadowing young Teak and to clear away heavy inflammable matter—wood, branches, dry brushwood—lying on the ground in the vicinity of young Teak-trees, especially if standing in groups. Considering the large extent of the Burma forests, these operations could not, as a matter of course, be carried on uniformly all over the area, but the beneficial effect of what had been done I noticed with satisfaction on each successive visit to the forests in 1868, 1876 and 1880, after I had relinquished my original charge.

Bonn, Germany. *Dietrich Brandis.*

Notes.

The Rural New Yorker speaks highly of the McPike Grape, originated by a vineyardist of that name in Alton, Illinois. It is a seedling of the Worden, hardy, with good leaves, large compact bunches of even size, berries with a blue-black bloom and ripening uniformly. The berries are of the largest size (three inches in circumference) and extremely juicy. The skin is thin, but not tender, the pulp is melting and the seeds are small and few. It is spoken of as an improved Eaton.

In the Museum of the Oxford Botanical Garden there is preserved a primitive utensil which was once used to protect greenhouse plants from cold in frosty weather. This is an open wicker box fixed upon four wheels. It used to be filled with red-hot charcoal and the gardener rolled it backward and forward in the glass-house throughout the night during severe weather. A correspondent of the *Journal of Horticulture* speaks of this as a very interesting reminder of the development of the apparatus for heating glass-houses.

For some reason probably connected with the hot summer and heavy rainfall, mushrooms are unusually abundant in the pastures and meadows about this city. In Dutchess County the farmers and others gather them and carry fine ones around to the different towns and villages for sale, and they are so abundant they are offered in quantities at thirty-five cents a bushel. *The Poughkeepsie Eagle* reports that not only true mushrooms but many other fungous growths, both edible and poisonous, are common in all parts of that city.

When seen in masses in their native homes Sobralias are among the most beautiful of Orchids, as various travelers have borne testimony. We learn from the *Orchid Review*, and record it as a matter of interest, therefore, that Mr. F. J. Le Moyne, of Chicago, is trying to make a complete collection of these plants. Most of the species are handsome, although they are not so much cultivated as they would be if their flowers were not so fugacious, and, in some cases, if they were not so large. The long succession of flowers which they bear compensates in some degree for the first effect.

Mr. W. Botting Hemsley, in writing of plant distribution in *Knowledge*, calls attention to the fact that Lord Howe Island, a speck of land less than a quarter of the size of the Isle of Wight, situated in mid-ocean, three hundred miles from the coast of New South Wales, produces four species of Palms peculiar to itself. The Seychelles group in the Indian Ocean is also interesting. These islands, more than thirty in number, are situated six hundred miles north-east of Madagascar, the largest being seventeen miles long and five miles wide, with an altitude of nearly three thousand feet. Three hundred and fifty species of flowering plants and Ferns are recorded from these islands, one-sixth of which have not been found elsewhere. Among the latter there are nine distinct kinds of Palms, and seven of these have not been found elsewhere, and among the latter class is the famous double Cocoanut or Cocoa de Mer.

This is the season of Sunflowers, and wherever a mass of yellow is needed they will never be a disappointment. In the herbaceous garden at Prospect Park the tall stalks of Helianthus orgyalis, in full flower from top to bottom, which means for a distance of ten feet, are very striking when standing against the dark green of the still taller Arundo donax, while the common Artichoke, H. tuberosus, is by no means to be despised. Helianthus mollis is a lower plant, two or three feet tall only and bearing light lemon-yellow flowers with a yellow disk and soft woolly-white leaves, while H. rigidus, with rich orange-yellow flowers, and rather a taller plant, would grace any garden. Besides these, H. multiflorus, which continues in bloom for a month, with its double variety, which flowers all summer long, H. decapetalus, the semi-double cup-shaped H. lætiflorus, with many rather coarser ones, are all useful in large wild gardens. These, with Heleniums, Rudbeckias and Silphiums, with their light yellow, almost straw-colored flowers and varied leaves, will suffice to make any border gay till mid-September, after which there are later varieties of almost equal merit.

The Pollination of Plums is the subject of Bulletin No. 53, issued by the Vermont Experiment Station, and prepared by Professor Waugh. Plums are uncertain in setting fruit, and this is partially due to lack of proper cross-pollination, and therefore different varieties should be planted together or scions of other varieties should be set in the tops of trees which do not bear satisfactory crops. This cross-pollination is provided for by the defectiveness of their floral parts and by the sterility of certain varieties toward their own pollen. American cultivated varieties have been derived from several botanical species, and these varieties retain, to some extent, the characters of the parents, and it is thought that botanical relationships will prove the best guide in cross-pollination. A very interesting account of the economic characters of the different groups is given, but it is admitted, after quoting the opinion of eminent horticulturists and botanists, that there are many questions, practical and theoretical, which are still open to investigation. Some of these questions are asked at the close of the bulletin, and readers are requested to make a reply. The statement that the Beach Plum, Prunus maritima, is of little importance for its fruit, although desirable for ornamentation, ought, we think, to be modified. We have seen individual trees of this species which bore fruit of beautiful color and rich flavor, and it seems to us that both in the line of selecting and hybridizing it is a promising tree for fruit. The bulletin is commended to all who wish to grow trees intelligently.

Chautauqua growers are complaining that they hardly get enough for grapes to pay for transportation to market, and in some sections farmers are allowing their apples to lie on the ground and rot or they feed them to hogs. This means that in many districts the fruit crop is uncommonly abundant. Nevertheless, the prices for fine fruit on the street-stands and in the fancy-fruit stores were rarely, if ever, higher than now. It ought to be added that the quality of the fruit offered has, perhaps, never been as good. The lesson of all this is that the only assured success for fruit growers is by careful cultivation, thinning, etc., to insure fruit of the very best quality, and then to withhold everything that is not strictly first-class. In spite of the surplus of ordinary grades of fruit and of the limited demand for fruits of the highest grade, it is evident that there is considerable margin for profit between the prices farmers receive and those the consumer pays. Among the showiest fruits now offered are immense Salway peaches, measuring fully seven inches around, the downy skin a cream-yellow, with bright crimson cheek. Persimmons, from Florida, are already quite abundant, and large, luscious specimens of a rich golden color cost sixty to seventy-five cents a dozen. As many as forty shipments of Alligator pears have been handled by one of the down-town retail fruit-stores since the beginning of the season in May, when this fruit came from the United States of Colombia. Later, Jamaica and Cuba furnished the supply, and from August to the close of the season in October they are received from Turks Islands, among the Bahamas. The demand for this fruit is reliable, and even now, near the end of the season, when the specimens are no larger than a good-sized Bartlett pear, they readily command from twenty to thirty cents each. Mangoes, which are also passing out of season, have eager buyers among persons familiar with this variously flavored apple of the tropics. An importation received from Cuba last week sold on sight at retail at ninety cents a dozen for the entire lot. The first cargo of Almeria grapes of this season, consisting of two thousand barrels, is now on the way to this country.

William Robinson, who for nearly twenty years has been at the head of the famous Langwater Gardens, belonging to Mrs. F. L. Ames, North Easton, Massachusetts, died of pneumonia on Wednesday last in the full vigor of his manhood at the age of forty-five years. Mr. Robinson was born in Bedel, Yorkshire, England, and learned his craft in such good gardens as those of the Duke of Cleveland and Sir Titus Salt, and he spent some years at the Veitchian Nurseries. He was a thorough gardener, well skilled in every department of his art, but he was especially noted as an expert in the cultivation of Orchids, and it will be difficult to find a successor who can worthily fill his place in charge of the most valuable collection of these plants on this continent. Mr. Robinson was more than a mere cultivator, and by his skill in hybridizing he has produced many interesting crosses. Some of his hybrid Cypripediums it would be almost impossible to duplicate, owing to the rarity of the parent plants. He was very successful with Masdevallias, which are somewhat difficult to manage in this climate, and several excellent hybrids of this genus originated by him have been distributed. Mr. Robinson was an occasional contributor to these columns, and what he had learned by study and observation he took care to write with clearness and accuracy, and he was always ready to give information from the abundant stores of his experience. He not only loved his work, and was loyal to his art, but he compelled respect by his straightforward honesty and manliness of character.